



SCALING INNOVATIVE ELEMENTS OF A NATIONAL EDUCATION ONLINE PLATFORM IN UZBEKISTAN

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This case study is a result of the KIX EAP Learning Cycle "Feasibility Studies on Scaling Innovation". Organised by NORRAG and the Nazarbayev University Graduate School of Education (NUGSE), this skills- and outcomes-oriented course ran from September 2020 to January 2021. Across 11 weeks, this professional course enabled national experts to publish evidence-based studies by examining the conditions whereby it is feasible to scale up an existing innovation or a pilot project in their country. Nine teams of educational sector experts from Georgia, Kyrgyzstan, Moldova, Tajikistan and Uzbekistan took part in this Learning Cycle.



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CONTENTS

List of acronyms and abbreviations	05
Acknowledgements	06
Executive Summary	07
1. Background	09
2. The Edu Market: A Brief Description	11
3. Challenges in the first phase of implementation	13
4. Theory of Change of the Edu Market project	15
5. Identification of innovative features of Edu Market	16
5.1 Methodology	16
5.2 Findings	17
5.3 Summary of findings on the innovation of Edu Market	19
6. Feasibility of Scaling the Edu Market	21
7. Recommendations	23
References	24

Tables

Table 1. Analysis of the project development activities	12
Table 2. The development process of Edu Market platform	14
Table 3. Advantages of the Edu Market	20

Figures

Figure 1. Project implementation during the first phase	12
Figure 2. Theory of change	15

LIST OF ACRONYMS AND ABBREVIATIONS

PISA	Programme for International Student Assessment
PIRLS	Progress in International Reading Literacy Studies
KIX EAP	Knowledge Innovation Exchange Europe, Asia, Pacific Hub

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EXECUTIVE SUMMARY

Introduction

In 2020, the Republic of Uzbekistan introduced a national education online platform, Edu Market, to be used by primary school children in the republic. The aim of the Edu Market project was to improve the quality of education in the country, making learning more interesting and interactive, and involving a greater number of schoolchildren into the process. This report was developed to evaluate the implementation of the first phase of the Edu Market project and conduct a feasibility assessment for the subsequent stages of the project where it will be scaled up to higher levels of education.

Primary education is aimed at forming the foundations of literacy, knowledge, and skills necessary for obtaining general secondary education. Upon completion of primary school, the child should be proficient in reading, writing and numeracy skills. The foundations of competencies are laid in primary school, and the quality and effectiveness of subsequent education depend on the extent to which they were formed at this stage. Therefore, strong skills development at the primary level is a prerequisite for students later in life.

Project

Edu Market is the national education online platform developed by the Ministry of Public Education. The platform is focused on children's development and education through games with the application of modern technologies. The key beneficiaries of the platform are primary school children and their parents, teachers, and the state.

Theory of Change

To understand the current functioning of the Edu Market online platform, the feasibility report team developed the following provisional Theory of Change for the platform:

If the Edu Market online platform is implemented in all schools of the country as an additional educative tool and is actively used by primary school children on a regular basis, this will lead to knowledge levels increase and development of soft skills among children, because the platform creates

opportunities to develop and learn basic skills through interactive games.

Identifying the innovative features of Edu Market

For the purpose of this study, the opinion of the schoolteachers and the parents of the primary school children, who actively use the platform, was collected through surveys.

Additionally, interviews were conducted with the developers of the Edu Market platform content, employees of two big internet companies in Tashkent, and one mobile operator who works on the whole territory of Uzbekistan. Further, an unstructured interview with an employee of the World Bank office in Uzbekistan was conducted.

The key innovative features identified are:

- providing children with the possibility to learn independently and developing their sense of responsibility;
- gamification to ease the learning process and make memorization and training less boring for children;
- importance of soft skills development guaranteed by Edu Market platform.

Feasibility of Scaling the Edu Market

Marketability: The target audience was identified, but the promotion campaign was weak; so, to increase awareness a more effective campaign is required.

Resources needed for usage: The internet connection problems and high costs were identified as an impediment to use; so, developing offline modifications to be downloaded and used is needed.

Operational feasibility: The project covers the needs of children as the main beneficiaries; so, correlating and integrating games provided in the school program is required.

Technical feasibility: Low involvement of teachers and private companies was identified; so, increasing teachers' and private sector involvement is needed.

Recommendations

- Developing an offline version of the platform that can be downloaded and used without the constant need for an internet connection.
- Involving more primary school teachers to correlate better tasks and games in the platform with the school program.
- Encouraging the private sector to invest in platform development
- Creating a more efficient promo campaign that provides information about Edu Market to beneficiaries in the whole Republic.

1

BACKGROUND

The educational system in Uzbekistan is regulated by a number of documents: the Law of the Republic of Uzbekistan “On Education”, “National Program for Personnel Training”, “State Educational Standard” and decrees of the President, the Cabinet of Ministers and the Ministry of Public Education.

Uzbekistan guarantees its residents free access to education up to the secondary level. Starting from kindergarten, the child is prepared for school. In Uzbekistan, many parents want to send their children to schools with Russian as the language of instruction, which only constitutes about 8% of the total number of schools. It is rather difficult to place a child in school due to a much higher demand relative to the supply. This problem is especially acute in the provinces where on average there are only two to three prestigious schools, which are extremely difficult to get into. Children usually attend preparatory courses before school, after which they pass entrance tests: reading (the norm is at least 30-40 words per minute), dictation and solving math problems. At the same time, the class size is fairly large at up to 40 students per class.

Classes in schools begin on September 2 and last until May 25 with holidays and interterm breaks. Children enter grade 1 between the ages of 6 and 7 years. The number of six-year-olds in a class should not exceed a certain percentage. Psychological supervision is established for every six-year-old child. After six months, the psychologist decides whether the child is able to continue education or whether he/she should repeat a year.

All first graders are provided with free textbooks and a set of stationery (as a gift from the President). Starting from the second grade, students rent textbooks or get them for free depending on the school. The rental price depends on the number of books. Recently, all schools have been provided with electronic textbooks and didactic materials. However, due to the lack of computer classes, it is very difficult for students to use them. Children from low-income or large families are provided textbooks free of charge. Apart from this, additional benefits are provided in the form of a free lunch (up to grade 4) and a set of winter clothes.

After obtaining independence, the State began to phase out

the textbooks issued by Soviet schools. Instead, new textbooks, written by Uzbek authors, were used. As the work was done in a rush, the quality of books was uneven; in addition, some textbooks were translated from foreign textbooks and manuals. The curriculum in physics and mathematics was significantly simplified. In the field of humanities, more radical transformations have taken place. For example, a subject titled ‘National Independence’ has been introduced, where the main emphasis is put on the patriotic education of students.

Since 2012, by the Decree of the President, the study of foreign languages begins from the first grade. Russian in Uzbek schools is taught as a compulsory second language. For foreign language teachers in schools, allowances are provided: 30% for rural schools and 15% for urban ones.

All teachers must pass the state certification every five years. Those who work in academic lyceums and vocational colleges must pass this certification every 3 years. Depending on its results, the teacher is assigned one of the categories, which has its own conditions, especially the teacher’s rating, his participation in the social life of the school, professional achievements and monitoring of students’ knowledge in his subject are taken into account. Supervision of teachers by higher authorities is conducted using the documentation prepared by the teacher. In addition to basic working materials (plans, lesson notes, class journal), the teacher maintains a whole list of documents: folders on the implementation of various resolutions of the Cabinet of Ministers and the President, notes on spirituality and self-education, notes on classes with lagging and gifted children, a notebook of analyses of the lessons of colleagues and so on.

Primary education is aimed at forming the foundations of literacy, knowledge, and skills necessary for obtaining general secondary education. In Uzbekistan, primary education is obligatory, free, and universal. This ensures that all children

who have reached school age attend public or private primary schools. Upon completion of primary school, the child should be proficient in reading, writing and numeracy skills. The student is taught the elements of theoretical thinking, the ability to self-control their education or learning. The quality and content of school subjects in primary school are flexible in relation to different types of schools and learning environments.

Primary and secondary education in Uzbekistan is organizationally and substantively inextricably linked. Each general education school organizes education at both levels of primary and general secondary education. This ensures full registration of primary school graduates and continuity in the general secondary education system.

In 2021, the knowledge of school children in Uzbekistan will be assessed within the framework of the Programme for International Student Assessment (PISA) and Progress in International Reading Literacy Study (PIRLS) studies. These international studies will compare the education system with other countries and identify existing gaps.

Having entered the group of developed countries in terms of school enrollment, gender equality in education and other social spheres, Uzbekistan has come to a new, global challenge – achieving a new breakthrough in terms of creative, flexible thinking within the educated youth. In this educational system, the teacher must be a creator and not a passive executor of a scripted curriculum where teaching routines are entirely defined and managed externally. Moreover, everything with which a teacher's life is connected (salary, relationships with parents and supervisors, reporting, etc.) should be related to the main purpose: to educate in a different way. Thus, new cultures and processes in education will be created.

Currently among the main problems in the sector is personnel shortage. Therefore, the Ministry of Public Education aims to create a new system of training for future and current teachers and improve their qualifications. The creation of a new qualification standard for teachers and their retention aims to: competitively select teachers for hire, invite foreign specialists, introduce radical change in the activities of a training institute and create a motivation system. All these measures can help to increase the quality of education.

In addition, it is noticed that the educational system should constantly develop to provide children the skills needed in their future. Apart from complex and technical skills, it is required to implement an education system that develops the following soft skills:

- complex problem solving;
- critical thinking;
- creativity;
- people management;
- coordinating with others;

- emotional intelligence;
- judgment and decision-making;
- service orientation;
- negotiation;
- cognitive flexibility.

The main goal of the school system in Uzbekistan is to prepare the graduate to use the knowledge acquired in everyday life. However, currently, it is not achieved due to the lack of attention to the practical component of the teaching content. The consequence of this is the lack of practice-oriented knowledge and skills. The development of all the above-mentioned skills should start from the beginning of children's education, increasing the difficulty in tasks in accordance with the level and age of the child.

The emerging consensus in the international discourse of 21st-century education has seemed to move from narrow subject knowledge and skills to meta-cognitive skills and competencies that give preference to the development of universal competencies that can ensure success in a wide variety of situations and conditions (not only educational, but also personal, self-educational, and life). Particular attention is paid to assessing how students master various learning strategies and assessing interdisciplinary competence, which implies the ability to apply knowledge gained in one subject area in solving problems from another, use the knowledge gained in various subjects to solve a practical problem, and many others (cooperate, communicate with adults and peers, people of different nationalities and cultures, actively participate in the life of society, independently organize activities, be ready to solve various problems and use new technologies).

The foundations of such competencies are laid in primary school, and the quality and effectiveness of subsequent education depend on the extent to which they were formed at this stage. At the same time, one should not forget that the full-fledged formation of competencies of this type requires the active participation of the pupils themselves, and throughout the entire period of study. After all, in order to learn to communicate, they need to participate in it, master languages, various methods of conversation, acquire their own experience of explaining, telling, criticizing, defending a particular position, etc.

2

THE EDU MARKET: A BRIEF DESCRIPTION

Date of the beginning of the project: February 2020

Date of the finish of the project: ongoing

Sponsor: the Ministry of Public Education of the Republic of Uzbekistan

Edu Market project is the national educational online platform developed by the Ministry of Public Education. The project is focused on children's development and education through games with the application of modern technologies. The training sessions, included in the tasks provided, were created by teachers and experts in the field. There is an opportunity to choose either Uzbek or Russian as the language of instruction. Children acquire new knowledge by completing training sessions with ascending complexity, which helps them to develop different skills through their work. The participants get points for correct answers and commitment. In addition, after finishing each training session, they obtain one item for their virtual school.

The project offers several features:

- Virtual school is the collection of books, manuals, journals that children can use for searching for new information and expanding their knowledge;
- Online schooling system is the catalogue of different educational materials which is accessible 24/7;
- Virtual library is the educational "institution" where mobile devices are used for the learning process;
- Online statistics of pupil's academic performance is the feature that can be used to track student's performance;
- Virtual house and virtual city are the online world that can be transmitted to a student with the usage of his/her senses, e.g., hearing, vision, etc.;
- Online points are the points that students can earn for their successful work;
- Contests of different nature are organized among the students. The names of the winners who obtain first to tenth place are published on the website.

Objectives of the project:

- To make the process of learning and knowledge assimilation more convenient and interesting for students;

- To create a transparent system for monitoring a child's progress for parents and teachers;
- To build the right knowledge acquisition system for every age;
- To transform mobile devices from only entertaining instruments to a complete educational tool for children.

Project's beneficiaries:

- **Uzbekistani children** from six to eleven years old, attending primary schools. Children gain knowledge, learn in an easier way, and are able to compare their performance with others' progress, obtaining additional motivation;
- **Parents** can monitor their child's academic performance, have direct communication with teachers, and get a better understanding of their child's needs and aspirations;
- **The State** understands better the needs of the youth, generates an environment for early detection of problems in human resources development, and creates better conditions for the country's human capital development.

Project's target audience:

- The project is directed to all children between the age of from six to eleven in Uzbekistan; no specific region was chosen.

Innovative characteristics of the project:

- Online learning;
- Gamification;
- Virtual environment that embeds learning and entertainment.

The Republic of Uzbekistan had conditions for the creation and implementation of such a project. Long before the COVID-19 pandemic, efforts to digitalize schooling in Uzbekistan began. The implementation of technology was intended to eliminate urgent problems in this area: a low level of student information

content, a vast volume of documentation held by teachers, poor knowledge control and parental involvement. The first mention of the use of technical solutions in Uzbekistan's schools can be traced back to 2006 when an online school initiative was implemented. The idea of that project was to provide parents with a copy of a paper school diary in electronic format and to submit reviews via SMS.

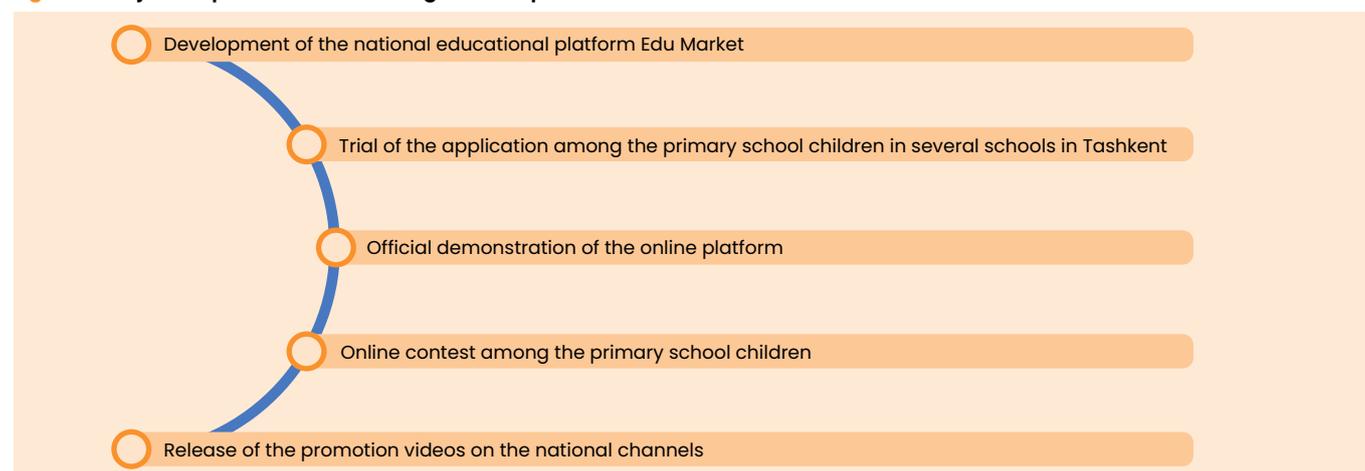
The project is aimed at improving the quality of education in the country, making learning more interesting and interactive, and involving a greater number of schoolchildren in the process. Various activities were implemented to develop the online platform and increase awareness among the population and in particular, the beneficiaries. Their list and the list of outputs and short-term outcomes of the project are presented in Table 1.

Table 1. Analysis of the project development activities

Goal and outcomes of the project	Activities implemented by the project	Outputs of the project	Expected short-term outcomes of the project
<ol style="list-style-type: none"> To make the process of learning and knowledge assimilation more convenient and interesting for schoolchildren; To create a transparent system for monitoring a child's progress for parents and teachers; To build the right knowledge acquisition system for every age; To transform a gadget from only entertaining instruments to a complete educational tool for children; To create a digital educational platform in Uzbekistan that becomes a base for further digital education development in the country. 	<ol style="list-style-type: none"> The demo version of applications was trialed in the secondary school #94 in Tashkent (capital city). The trial of the application was later conducted among the primary school children in several schools of Tashkent. The application and its use was officially demonstrated to the primary school children, their parents and teachers at INHA University in Tashkent on 15 February 2020. The online contest among the primary school children who actively use the application on Android and iOS mobile platforms was held in the summer of 2020. The winners, i.e. children who achieved the highest results in the application games, were awarded certificates and tablets. The promotion videos were released on the national channels of Uzbekistan. 	<ol style="list-style-type: none"> Currently, there are more than 200,000 downloads of the application. There are more than 40,000 users of the application. More than 20,000 children aged up to 12 participated in the online contest based on the results of the games they played in the application. 	<ol style="list-style-type: none"> An increased level in the primary school children's performance. Further development of a digital approach to teaching and learning. A growing interest in learning among primary school children. Skills development among primary school children. Increased monitoring by / awareness of parents on their children's learning activities.

Step-by-step process of the implementation of the project during its first phase is presented in the figure below (from top to bottom).

Figure 1. Project implementation during the first phase



3

CHALLENGES IN THE FIRST PHASE OF IMPLEMENTATION

As the project is still ongoing and the first phase of implementation will only be finished by the end of the year, we cannot determine whether the goals stated initially in the project documentation have been achieved. However, we have conducted an analysis to identify potential problems and areas for further development on the basis of the obtained information. The results of this analysis are presented in the below paragraphs.

Many studies were conducted to assess the effects of gamification in the classroom and its influence on intrinsic motivation, social comparison, satisfaction, effort, and academic performance (for example, Huang & Soman, 2013; Hanus & Fox, 2015; Su, 2016; Yildirim, 2017). They have found a positive correlation between all the outcomes and the quality and intensity of games that were used in the educational process. Gamification, according to the results of the studies, can be perceived as a powerful tool that can help children to assimilate information in a more interesting way, increasing their commitment to studies and goals achievement. The Edu Market project had taken these learnings into consideration; however, some issues can be reconsidered in the subsequent phases of project implementation.

One of the most problematic goals is one related to a child's progress monitoring by parents and teachers. According to our observations, neither parents nor teachers were provided with any instructions related to that matter. In addition, to provide recommendations regarding learning progress teachers must complete full information about games offered, their levels of complexity, expected outcomes and competencies each game is working with. Without practical experience or guidelines, they cannot provide full support to students and their parents and suggest games that could be more appropriate in particular cases.

On the other hand, we would like to suggest for the following phases of project implementation the inclusion of one specific goal that seems unconsidered in the first phase. It is necessary for the project to amplify the list of potential users by including children with different disabilities. Taking them

into consideration will not only diversify the target audience of Edu Market, but also will help it to become more socially responsible. It will positively influence the project's image both in Uzbekistan and in the international market.

The project was launched in February 2020, just before the outbreak of the COVID-19 pandemic in mid-March 2020. The schools' administration and teachers had to find online teaching and learning solutions throughout the country. Due to schools being closed and teachers as well as project developers being involved in the material design for the online school, there were no possibilities to promote the project in the face-to-face mode.

The low levels of trials in schools can also be attributed to the COVID-19 outbreak. Students and teachers outside of the capital might have been interested in using the platform, however, they did not get enough information on it. This fact influenced the audience number and decreased the positive expected outcome in terms of population involvement during the first phase of the project implementation.

Another possible reason for the lack of popularity of the online platform among primary school children and their parents across the country is the availability of smartphones. As the application requires having Android and iOS mobile platforms, all the users should have a mobile phone that meets these requirements. Therefore, even though the project has been advertised via the media and the parents were aware of its functions, some children in the country might not have had an opportunity to download it and play educational games.

The total cost of the project reached 400,000 USD, including 10,000 USD of operational costs per month and 50,000 USD of implementational costs. The content of each game is developed by professionals and the costs of content development are quite low: 20 USD per game. The programming of each game costs 40 USD. Although the total project cost of 400,000 USD is high, it includes stages 2 and 3 (covering secondary school-age children).

Table 2. The development process of Edu Market platform

Development stage	Process description	Period
Development of the key concepts and tasks 1 st stage	Development of the project concepts and task requirements Content requirements for the 1 st stage (1-4 grades, primary school education)	2 months
Development of the content materials 1 st stage (1-4 grades, primary school education)	Material development of the following subjects/aspects: <ul style="list-style-type: none"> ■ ABC ■ Parts (of a whole) ■ Literacy ■ Colors ■ Figures and shapes ■ Outlook ■ Coloration / coloring books ■ The world ■ Music ■ Reading ■ Fine arts 	2 months
Language adaptation Orientation activities 1 st stage (1-4 grades, primary school education)	Language adaptation of the platform content (Uzbek and Russian languages) Conducting orientation activities and contests among primary school children and their parents	3 months
Development of the key concepts 2 nd stage	Development of the content requirements for the 2 nd stage (5-9 grades, secondary school education)	1 month
Development of the content materials 2 nd stage (5-9 grades, secondary school education)	Material development of the following subjects/aspects: <ul style="list-style-type: none"> ■ Uzbek language ■ Russian language ■ English language ■ Mathematics ■ Algebra and geometry ■ Information technologies ■ Programming basics ■ Geography ■ Physics ■ Chemistry ■ Logical mathematics ■ Biology 	4 months
Language adaptation Orientation activities 2 nd stage (5-9 grades, secondary school education)	Language adaptation of the platform content (Uzbek and Russian languages) Conducting orientation activities and contests among secondary school children and their parents	2 months
Development of the key concepts 3 rd stage	Development of the content requirements for the 3 rd stage (10-11 grades, high school education)	1 month
Development of the content materials 3 rd stage (10-11 grades, high school education)	Material development of the following subjects/aspects: <ul style="list-style-type: none"> ■ Future professions ■ Programming ■ Web design ■ Vocational guidance 	5 months
Language adaptation 3 rd stage (10-11 grades, high school education)	Language adaptation of the platform content (Uzbek and Russian languages) Conducting orientation activities and contests among high school children and their parents	2 months

The analysis of data related to the number of downloads of the application and active users shows that in around 20 per cent of total downloads the platform is actively used. In 80 per cent of the downloads, the application is being deleted or is not used actively. We can assume two possible reasons for this situation:

1. the users are not interested in the content; therefore after trying the platform they quit;
2. the users are experiencing technical difficulties and/or problems with the internet connection needed to use the platform.

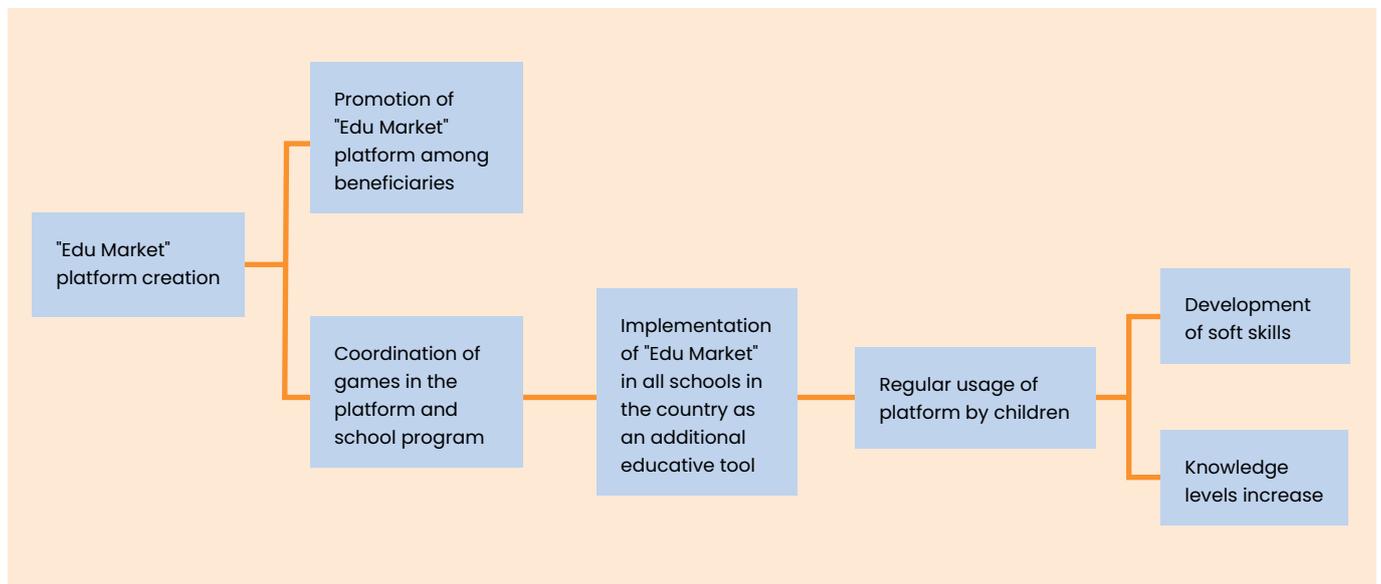
4

THEORY OF CHANGE OF THE EDU MARKET PROJECT

The changes implemented in society and the educational sphere with the Edu Market platform application can be seen in the figure below.

If we check society's reaction to the implementation of the Edu Market platform, we can see that there are different opinions in that regard. It was created to transform mobile devices into learning tools, making it more accessible, interesting and

Figure 2. Theory of Change



If the Edu Market online platform is implemented in all schools of the country as an additional educative tool and is actively used by the primary school children on a regular basis, this will lead to increased knowledge levels and development of soft skills among children, because the platform creates opportunities to develop and learn basic skills through the interactive games.

usable for the learning process. However, in social networks, there were negative associations being made between the platform and children's development and some comments highlighted the expectation that the platform might "dull" children's minds.

Pandemic and lockdown showed that the usage of digital platforms in education can become a strong asset and useful instrument. It must be mentioned that Uzbek society's approach to the digitalization of education today remains ambiguous. Supporters of paper and old-fashioned working practices believe this mechanism to be premature and address this subject actively on social media. While some within the education system are not prepared to adopt new solutions, technological and digital educational tools have the potential to solve many challenges, especially in the context of school closures during the Covid-19 pandemic.

5

IDENTIFICATION OF INNOVATIVE FEATURES OF EDU MARKET

To identify innovative features of the Edu Market project and to make recommendations for improved implementation of the platform in the subsequent phases, the feasibility study team collected additional data through surveys and interviews. The survey and interview questions were developed to collect data to understand the validity of the provisional theory of change developed for this study.

5.1 Methodology

The study was conducted in all regions of Uzbekistan. In order to identify the success of the mobile application, it was important to obtain user feedback. Therefore, for the purpose of this study, the opinion of schoolteachers and parents of primary school children, who actively use the platform were surveyed. Additional interviews were also conducted with the developers of the Edu Market platform content, employees of two big internet companies in Tashkent, and one mobile operator that works in the whole territory of Uzbekistan. Further, an unstructured interview with an employee of the World Bank office in Uzbekistan was conducted.

Participants

Fifty-six parents participated in the survey, among which six were males and fifty were females. The age range was quite diverse (18 – 51 years). The majority of the parents were 31-40 and 41-50 years old, which equalled 32.1 per cent and 35.7 per cent respectively of those surveyed. 23.2 per cent of parents were 26-30 years old. A considerably smaller number of respondents were older than 51 (4 parents) and between the ages of 18 and 25 years old (only one parent). Most respondents speak Uzbek (55.4 per cent) or Russian (39.3 per cent) in their families. The rest used Tajik (two parents) or Karakalpak (only one parent) as a means of communication. 64.3 per cent of the respondents resided in the city of Tashkent; 8 per cent of participants lived in the Tashkent region, and the rest resided in the other eight regions (Andijan, Bukhara, Fergana, Karakalpakstan, Khorezm, Samarkand, Sirdarya, and Surkhandarya). No parent responses were received from the families living in Jizzakh, Namangan, Navoi, Qashqadarya regions.

One hundred and seven schoolteachers participated in the survey. The majority were female (88.8 per cent), and the remaining 11.2 per cent were males. The age ranged from 18 up to older than 51 years old. Most teachers were 31-40 (44 participants) and 41-50 (34 participants) years old. Sixteen per cent of schoolteachers were older than 51 years old. A similar number of teachers aged 18-25 (7 respondents) and 26-30 (6 respondents) took part in the study. More than half (51.4 per cent) of the participants were located in the city of Tashkent. Twelve per cent of teachers were from Namangan region. The same number of respondents lived in Tashkent, Andijan and Khorezm regions (six persons each). Samarkand and Fergana regions were represented by a slightly smaller number, four and five teachers respectively. Bukhara, Surkhandarya, and Qashqadarya regions had three participants each. Two teachers resided in Sirdarya region, and there was one respondent from Jizzakh region and one from Karakalpakstan. Only one region, Navoi, was not presented in the survey.

Six representatives of the content department of the Ministry of Public Education took part in the interview. Four of them were directly involved in the development of the Edu Market platform content. The other two were the head and the deputy director of the department.

The interviews were also conducted with four employees of the marketing and sales departments of two private internet companies that operate in Tashkent and Tashkent region, two employees from private mobile companies and one representative of the World Bank office in Uzbekistan.

Instruments

As it was important to cover a great number of the Edu Market platform users, the online questionnaires for schoolteachers and school children's parents were developed. The questionnaire for the parents also included some questions for their children to fill out with the parents. Each questionnaire was designed in two languages, Uzbek and Russian, as they represented the primary language of communication for most of the respondents.

The interview questions for the representatives of the Ministry of Public Education were written in both Uzbek and Russian languages. The main focus of the interview was on the content development process, identifying the key features, and providing suggestions on the possible improvement of the platform.

Interviews with the private sector and World Bank representatives had different objectives. In the first case, we aimed to evaluate the readiness of the market for the mobile platform, determine the problems that users could face while playing, and the solutions the companies could offer. In the second case, the evaluation of World Bank experience in the educational sphere was required. In both cases the interviews were unstructured, so the interviewees had more liberty to share their ideas and opinions.

The use of the two research instruments was guaranteed to obtain qualitative and quantitative data.

Procedures

The questionnaires as a Google form were disseminated through a number of Telegram channels the researchers of the project belonged to. This method of dissemination was found to be the most efficient one as it allowed reaching the representatives of different regions. The interviews were conducted face to face by two of the researchers of the project. All the participants were guaranteed anonymity and no personal questions were required. The data collection took more than two weeks. When the Google forms were closed for accepting the responses, the results of the Uzbek and Russian versions of the questionnaires were combined and saved in the Excel spreadsheet. The interview findings were transcribed by one of the researchers. After collecting and organizing all the data provided by the respondents, they were translated into the English language for analysis.

Data analysis

The statistical analysis of the questionnaire results was done through IBM SPSS Statistics 23. The interviews were analyzed with the application of semantic analysis techniques, where main concepts, ideas and emotions were measured.

5.2 Findings

The analysis of the responses allowed identifying the key advantageous and innovative features of the online platform. These findings have been presented below.

Parents

The findings showed that most families had two (22 participants) or three (20 participants) children; only nine parents indicated that there were more than four children in

their families. Interestingly, the school children who actively used the Edu Market platform were different in each family. 75 per cent of the respondents indicated that only one child was using the mobile application. 16.1 per cent of the participants responded that two children in their families were using the platform on a frequent basis. Most school children started using the online application several days ago (46.4 per cent) and a few months ago (32.1 per cent). Whereas twelve parents informed that their children began using the Edu Market platform a week and a month ago (six parents each). The same number of participants responded that they learned about the application from schoolteachers and social networks (33.9 per cent each). Nine parents saw a TV advertisement, and seven parents were informed about the Edu Market platform by their children.

It should be noted that independent learning, modern technology usage and gamification were evaluated positively by parents. According to the parents' point of view, the games were covering different areas of children's education and the overall level of satisfaction was quite high.

There was a correlation between the level of satisfaction with an Internet connection and the place of residence of participants ($R=0.78$). The parents from outside the capital regions reported problems with the platform caused by internet connection issues, while there were no such problems in the city Tashkent and Tashkent region. This factor could affect the level of usage of the platform and reduce the number of potential users.

The importance of such features as independent learning was noticed more by those parents who have more than two children at home. The correlation between these two variables is quite strong ($R=0.99$) and could be explained by various factors. First, the parents had a chance to use that time for themselves or spend it with other members of the family, increasing the quality of relationships and interactions. Second, it developed in children more independence in decision making, responsibility for their actions and readiness to face challenges.

Parents who reported their assistance in downloading and installing the Edu Market app had scored higher in providing help to their children in tasks realization ($R=0.94$). In addition, a strong correlation was found between the need for a larger variety of games ($R=0.96$) and their increased difficulty ($R=0.97$), expressed by children, and less involvement of parents in the playing process.

Children

Children evaluated more Edu Market platform characteristics positively rather than negatively. In particular, the chance to study independently was perceived as a positive feature by 51.8% of respondents. In addition, 50.0% evaluated the

application of games in the learning process, the quality of image in the application and the variety of tasks in the games positively. However, the number of games provided on the platform, the difficulty of tasks in the games, and the interface of the platform received fewer positive evaluations from 42.9%, 39.3% and 37.5% of the respondents respectively.

Children's answers showed a strong correlation between the variety of games and their difficulty ($R=0.98$): the higher the score in need for variety, the bigger the need to have more complex games on the platform. We observed that those children who were actively seeking out diverse games were also ready to take on higher levels of challenges. This shows there was a justifiable demand for further development and diversification of Edu Market's gamified platform.

Due to ethical reasons, we did not measure the age of children who took part in our survey through their parents, we cannot determine whether the importance of these two characteristics of the platform for players depended on their age.

The independent learning factor and its recognition showed a mediator effect in the above-mentioned correlation between games variety and their difficulty ($R=0.82$), which makes us assume that there was a possible influence of the age of the respondents on the relations between these variables. Other factors that could have impacted the importance of independent learning, like the number of children in the family ($R=0.49$) or games qualities (variety: $R=0.4$, difficulty: $R=0.11$) show no correlation.

Teachers

The analysis of the online survey revealed that almost half of the responding teachers (48.6 per cent) had more than 15 years of teaching experience. Twenty-six teachers had been working in schools for 4 to 10 years. A slightly smaller number of respondents had 1-3 (14 per cent) and 11-15 (9.3 per cent) years of teaching experience. The rest (3.7 per cent) had been working at school for less than a year. The majority of participants (58.9 per cent) used Russian as the language of instruction. Forty teachers spoke Uzbek in the classroom. Karakalpak, Tajik, and English languages were used by the other 3.7 per cent of the respondents.

The average number of children in their classrooms varied. More than half of the teachers (52.3 per cent) informed that there were more than 31 pupils in the class. 33.6 per cent of participants responded that 26-30 children studied in their classroom. The rest indicated that there were 16-25 and 10-15 pupils in the classroom, which was 12.1 and 1.9 per cent of the teacher respondents respectively. In their responses, teachers positively evaluated one of the characteristics of Edu Market stated by its developers: the development of additional

skills rather than simple learning (56.0 per cent). In addition, gamification was also considered by the majority (54.2 per cent) as an instrument that helped better understand the information provided during studies. It should be noted that 43.9 per cent of participants reported using the games from the platform as assignments for their students. The application of modern technologies was evaluated positively (50.4 per cent) as well.

Interestingly, most respondents (54.2 per cent) learned about the Edu Market platform several months ago. A smaller number of teachers (33.6 per cent) found out about the online application only a few days ago. Others (12.1 per cent) learned about the platform about a week up to a month before the survey. Fifty-nine teachers learned about the online application through social networks. The same number of participants learned about the Edu Market platform from the channel of the Ministry of Public Education and the TV advertisement (16 teachers each). A slightly smaller number of respondents (13 teachers) were informed by other schoolteachers. Three respondents found out about the online application from students. Less than 30.0 per cent of teachers who took part in the survey were familiar with the functionality of the platform (29.9 per cent) or the competencies that were developed by its use (29.0 per cent). However, the increase in students' knowledge levels using the application was noticed by 39.2 per cent.

Fewer teachers praised children's independent learning (31.8 per cent agree with its development) and information search (38.3 per cent), according to the results obtained. However, those who showed a positive attitude towards these factors, scored higher in usage of new technologies ($R=0.94$) and game usage ($R=0.98$) in the educational process. The survey showed that 33.6 per cent of teacher respondents installed and tried to use the platform.

Developers of Edu Market platform

The interviews conducted with developers of the platform showed that the strongest feature of the platform from their perspective was the gamification of learning. A game as an educational tool was perceived positively by all the respondents, showing unanimity in that matter.

The main mission of this platform, according to the respondents, was to cultivate a generation of smart, erudite, hard-working children who would strive for self-development. Second, it aimed to make learning and assimilation of knowledge more interesting for children. Third, Edu Market helped create transparent monitoring of child's progress for parents and teachers. And finally, one of the key objectives was to make mobile devices for children not only entertaining but also a teaching tool.

Among the advantages of the platform were named:

- content in Uzbek (even translated from Russian);
- possibility to learn independently, which children would find more convenient;
- a large number of games that were based on school program;
- development of visual characteristics of the platform.

However, the respondents mentioned several areas that need to be developed in relation to the Edu Market platform. Among them were the need to:

- adapt the platform to international standards (UK, Europe, USA, rather than Russia);
- adapt the content to Uzbek reality;
- diversify the games provided on the platform;
- put the games in line with academic curricula;
- disseminate information among parents and schoolteachers about Edu Market platform;
- professionally develop those who work on games creation to ensure that they follow high educational standards.

The interviewees agreed on the need to adapt and change the content and approach in case Edu Market is scaled to children in middle school. However, two-thirds of the participants were not convinced that scaling would be effective. They suggested first working on problematic areas mentioned above that can create a base for scaling, rather than starting to scale now.

Private sector

The interviews conducted with employees of telecommunication companies had the objective of identifying key problems a regular user of Edu Market could face because of technological challenges.

First, it was reported that around 96% of Uzbekistan's population had access to mobile technologies. 26.5 thousand mobile stations were installed in the republic, the density of coverage varied depending on the region and population density in the territory. According to the statistics provided, 22 million people had access to the internet and only around 3 million were using it from computers. Others preferred to add mobile internet or to use mobile connections exclusively.

The country continues to build up the infrastructure of the wired high-speed Internet network; by the end of 2020, it was planned to reach 48 thousand kilometres of networks.

The Covid-19 pandemic impacted the quality of internet connection, especially in rural areas. Our interviewees reported that the companies were obliged to revise the norms of electromagnetic radiation and increase the power. In addition, all mobile operators that work in Uzbekistan territory

modernized almost 300 base stations to provide internet services. However, the quality and the speed continued to decrease, as the system was not ready for more active usage of the Internet which happened unexpectedly.

Currently, the companies are renovating the equipment and base stations, modernizing them in order to increase Internet speed. However, according to the data provided by our respondents, there was a chance that the problems would continue occurring in the next 2-3 years.

The other issue that was raised by interviewees in relation to Edu Market usage was the price of internet services, especially in rural areas. It was stated that the users from big cities used both mobile and computer internet connections. However, large parts of the republic's population had better access through mobile data. The prices for mobile internet in Uzbekistan in combination with service quality and speed deterioration decreases customers' satisfaction level and reduce their willingness to use the internet for any other reason other than sending and receiving messages. Mobile platform Edu Market requires users to spend mobile data that may not be affordable for much of the population.

World Bank representatives

The World Bank conducted a series of projects and studies in the educational field of Uzbekistan, determining its strengths and weaknesses and suggesting ways for further development. According to the information provided by the respondent, gamification, and its usage as one of the methods of work in and outside of the class were supported by the World Bank experts.

The other key characteristics of the platform – the development of soft skills in combination with hard ones – was also praised highly by the World Bank representative. A recent study conducted by the World Bank in Uzbekistan showed a considerable lack of soft skills among school and university students and graduates. The hard skills could be improved with the help of university and training centers. Soft skills, on the other hand, are acquired through personal experience, through trial and error. Edu Market platform works in that direction and helps school children develop their soft skills from an early age.

5.3 Summary of findings on the innovation of Edu Market

Overall, analysis of the findings revealed that the use of the Edu Market platform is not as active as it was expected prior to research conducted for the feasibility study. It was determined that the majority of the parents and teachers were not receiving information about it through official Ministry channels, which can influence platform perception. In addition, teachers reported a low level of familiarity with

the platform and the competencies it is enhancing. The perceived advantages of the Edu Market are shown in Table 3.

Table 3. Advantages of the Edu Market

	Perceived advantages	Areas for improvement
Children	<ul style="list-style-type: none"> chance to study independently application of games in the learning process quality of images in the application the variety of tasks in the games 	<ul style="list-style-type: none"> increasing the number of games provided in the platform diversifying the difficulty of tasks in the games improving the interface of the platform
Parents	<ul style="list-style-type: none"> independent learning modern technology usage gamification 	<ul style="list-style-type: none"> include more special effects add some logical games have more similar online platforms
Teachers	<ul style="list-style-type: none"> development of additional skills rather than simple learning gamification usage of games from the platform as assignments application of modern technologies 	<ul style="list-style-type: none"> add some logical games include more special effects improve the Internet speed make the platform available for all the children in the country
Developers of Edu Market	<ul style="list-style-type: none"> gamification content in Uzbek and Russian possibility to learn independently big number of games that are based on school program development of visual characteristics of the platform 	<ul style="list-style-type: none"> adapting the platform to international standards adapting the content to Uzbek reality diversifying the games provided in the platform putting the games in line with academic curricula disseminating information among parents and schoolteachers about Edu Market platform developing professionally those who work on games creation to ensure that they follow high educational standards

The Edu Market platform is evaluated positively mainly due to three key features. First, it provides children with the possibility to learn independently, developing their sense of responsibility. Second, participants in the study reported gamification to ease the learning process and make memorization and training less boring for children. This, in turn, helps to progress faster and develop the skills needed. Third, the importance of soft skills development guaranteed

by Edu Market platform was emphasized by different groups of participants as a strong advantage.

The following are the problems detected with the Edu Market platform. These issues are obstacles to platform usage scaling. As the usage of the platform depends on the price, speed and quality of Internet connection, customer satisfaction levels and the number of people who can afford to use the application are affected. Second, there is a need to adapt the content of games to Uzbekistan, at the same time diversifying it, so children will play games on familiar topics and not get bored. Lastly, there is a need to disseminate information about Edu Market platform through official channels, at the same time raising awareness among teachers and parents through such different activities as promo campaigns, training sessions, and seminars.

6

FEASIBILITY OF SCALING THE EDU MARKET

A feasibility study of scaling a project is an effective way to determine the possibility of expanding the useful features of the project at the moment of its creation and development. The detailed analysis was conducted to understand if there were any problems or obstacles that could impede the effective expansion of the project to higher levels of education beyond the initial implementation at the primary school level. In addition, it helps to determine new challenges and risks that were not taken into consideration in other stages of analysis. The feasibility analysis includes the following:

- economic feasibility (costs – revenue);
- financial feasibility (accessibility to financial resources);
- technical feasibility;
- ecological feasibility;
- social feasibility;
- legal feasibility;
- marketability;
- operational feasibility.

Economic feasibility. The Edu Market platform can be accessed by any student in Uzbekistan for free, which means that potentially 6.1 million children can take advantage of its usage. The development of one textbook for schools in Uzbekistan costs 30,000 – 45,000 USD and the printing of one copy of a textbook is 1.5 USD. It means that roughly the government needs 9.3 million USD to create and print one textbook for 6.1 million children.

60 USD is needed for the development and programming of one game in the Edu Market platform. The operational costs (10,000 USD per month) are still making the implementation and usage of the platform less expensive in comparison to textbook printing.

Financial feasibility. As the Edu Market platform is developed by the Ministry of Public Education of the Republic of Uzbekistan, it does not depend on private finances. The money is provided by the Ministry, that secures the financial stability of the project.

Technical feasibility. We have identified the low involvement of schoolteachers and private companies in project design and implementation. This factor influenced the way the platform and its games are designed. Edu Market is not taking into consideration the characteristics of Internet connection in Uzbekistan, and the school program is not completely covered. In the second stage of the project, it was partially considered, and the teachers were involved in the game design process.

The other problem can be a weak and relatively expensive Internet connection. The average salary in Uzbekistan, according to the State Committee of Statistics of Uzbekistan, is 246 USD/month. The cost of 1 GB of mobile Internet (3G) in Uzbekistan is around 4 USD per 1000 Mb. The cost of 1 GB of ground line Internet in Uzbekistan with a speed of 100 Mbit/sec is around 50 USD per month. The speed of fixed Internet as of June 1, 2020, was 27.12 Mbit/sec, the rate of mobile internet was 11.92 Mbit/sec. If we add this to the cost of any cheap smartphone – 100-150 USD – we will get a total cost that is not affordable for an observable percentage of the local population.

Ecological feasibility. The Edu Market platform does not affect the ecology of the region directly. However, as it is supposed to reduce the number of paper books used in schooling, we can assume that the paper waste volumes and emissions produced by typographies while printing books are reduced. Therefore, we can observe a positive effect on the ecology from the usage of Edu Market.

Social feasibility. The Edu Market platform is expected to influence positively levels of 21st century skills and soft skills development among young generations of Uzbekistan. In addition, it provides an opportunity for parents to maintain more effectively their work-life balance, without being worried that their children are using their free time inefficiently. However, due to technical problems with the Internet and the prices of mobile devices and Internet access, the usage of the Edu Market platform cannot become universal and mandatory for the whole country. If it is integrated into the school program as an obligatory study tool, it may create

a gap between those families who can afford its usage by buying mobile devices and providing children with the Internet of good quality, and those who cannot do it due to lack of affordability.

Legal feasibility. The Edu Market platform is created on the basis of the legislation of the Republic of Uzbekistan and it does not violate any local or international laws.

Marketability. Even if in the beginning of the project, the target audience was determined clearly, the promotion campaign was weak. The information about Edu Market creation was not spread through all possible channels among children, parents, or teachers. Furthermore, teachers do not have complete knowledge of the functionality of the platform. This can decrease their desire to use it and promote the platform among students. To increase awareness among the target audience, more effective campaigning is required. The promotion should be done through official social network channels of the Ministry of Public Education, Telegram channels, visits to schools in Tashkent as well as other regions. The Ministry can also share information with schools by sending them official letters containing explanations of the functionality and application of the platform and urging teachers to share that information with parents in each primary school class and later at higher school levels.

Operational feasibility. The Edu Market platform covers the needs of children as the main beneficiaries. However, more correlation and games integration with the school curriculum is required to ensure children's involvement.

7

RECOMMENDATIONS

The study was conducted to briefly evaluate the Edu Market platform and the feasibility of its scaling had its limitations. We could not receive a representative sample, therefore the results obtained cannot be extrapolated to the whole country. Moreover, those who participated in the survey were mostly the ones living in the capital city, Tashkent, and the rest represented only some regions of Uzbekistan. Second, due to ethical reasons, we were not able to contact children directly, who are the primary users of the platform. The answers we received from them were provided by parents who could have potentially decreased their validity and trustworthiness. The final limitation was the time constraints that did not allow us to reach a greater number of respondents.

However, based on the data collected from the primary users of the Edu Market and the feasibility analysis of the project, the following recommendations are proposed:

- Developing an offline version of the platform that can be downloaded and used without the constant need for an Internet connection;
- Involving more primary school teachers to align the tasks and games in the platform with the school curriculum;
- Encouraging the private sector to invest in platform development;
- Creating a more efficient promo campaign that provides information about Edu Market to beneficiaries in the whole republic.

If the Edu Market platform developers take these suggestions into consideration, it can increase the interest among the target audience towards its usage, affect positively the quality and content of tasks proposed and provide more opportunities for development to children of all families.

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